THE TAXONOMIC STATUS OF *CARDANTHERA* (ACANTHACEAE)

Heine, Kew. Bull. 16: 173-176, 1962, in his recent study of the African species of *Hygrophila* has discussed the taxonomic status of *Cardanthera* (*Synnema*) in some detail and suggested that it should be sunk in *Hygrophila* R. Br. He points out the inadequacy of generic delimitation in Acanthaceae, "too often based on single characters which naturally show overlappings, is in many cases clearly a matter of personal opinion and convenience". Neither the heterophyllous leaves nor the stamen-number provides a dependable character for the segregation of *Cardanthera* as a distinct genus from *Hygrophila* since *H. senegalensis*, a well-known African species, shows heterophylly and the number of stamens is variable both in *Cardanthera* and *Hygrophila*—being 2 or 4 in different species of these genera. The only remaining character that would help to distinguish *Cardanthera* from *Hygrophila* is the papilliform retinacula found in the former. This feature, if consistently found in all species, should, perhaps be sufficient to maintain *Cardanthera* as a genus. However, in *C. griffithii*, a little known species occurring in Sikkim, Upper Assam and N. Burma, capsules with fairly well developed retinacula are observed. The retinacula are definitely prominent compared to other species of *Cardanthera* like *C. difformis, C. avana, C. balsamica* and *C. uliginosa* but at the same time smaller and less markedly hook-shaped than those found in species of *Hygrophila* like *H. phlomoides* and *H. polysperma*. In other words *C. griffithii* may be considered as a connecting link between *Cardanthera* and *Hygrophila* as far as the nature of retinacula is concerned.

Palynological characters have been extensively used for generic delimitation in Acanthaceae. Pollen grains of *Hygrophila polysperma, H. phlomoides, H. auriculata* (*Asteracantha longifolia*), *Cardanthera difformis* and *C. pinnatifidum* show no diagnostic differences that might have justified the retention of *Cardanthera* (or *Asteracantha* for that matter) as a separate genus. These five species posses a pollen of uniform characteristics already reported for *Hygrophila* by Bhoj Raj, Grana palynol. 3: 95, 1961.

Having carefully considered all available evidence, it appears to me that Heine's suggestion to sink *Cardanthera* in *Hygrophila* can not but be supported. In this connection it can not be overlooked that Rafinesque, Fl. Tellur. 4: 66, 1838, undoubtedly recognising the unmistakable similarity of *Ruellia balsamica* Linn. f. to *Hygrophila* had made the proper transfer; later workers, however, referred it to *Adenosma, Cardanthera* and *Synnema*. The following new combinations are necessary for the Indian species not treated by Rafinesque and Heine. Only essential synonyms are given here since other species of *Hygrophila* found in India are also being studied and a fuller account will be published in due course.

Hygrophila balsamica (Linn. f.) Rafin. Fl. Tellur. 4: 66, 1838. *Ruellia balsamica* Linn. f. Suppl. 289, 1781. *Adenosma balsamica* (Linn. f.) Spreng. Syst. 2: 829, 1825; Nees in DC. Prodr. 11: 68, 1847; T. And. in J. Linn. Soc. 9: 454, 1867. *A. verticillata* Nees in Wall. Pl. As. Rar. 3: 79, 1832 (synon. nov.). *Cardanthera balsamica* (Linn. f.) Benth. ex Clarke in Hook. f. Fl. Brit. India 4: 404, 1884. *C. verticillata* (Nees) Benth. ex Clarke l.c. *Synnema balsamica* (Linn. f.) O. Ktze. Rev. Gen. 500, 1891; Lindau in Engl. & Prantl, Pflanzenfamilien IV(3B); 295, 1895; Alston in Trimen, Handbook Fl. Ceylon 4(suppl.): 224, 1931. *S. verticillata* (Nees) O. Ktze. l.c.

H. griffithii (T. And.) Sreem. comb. nov. *Adenosma griffithii* T. And. in J. Linn. Soc. 9: 454, 1867. *Cardanthera griffithii* (T. And.) Benth. ex Clarke l.c. *Synnema griffithii* (T. And.) O. Ktze. l.c.

H. pinnatifida (Dalz.) Sreem. comb. nov. *Nomaphila pinnatifida* Dalz. in Hook. Kew Journ. 3: 38, 1851. *Adenosma pinnatifidum* (Dalz.) T. And. l.c. 455. *Cardanthera pinnatifidum* (Dalz.) Benth. ex Clarke l.c. 405. *Synnema pinnatifidum* (Dalz.) O. Ktze. l.c.; Lindau l.c. 295.

H. difformis (Linn. f.) Sreem. et Bennet comb. nov. *Ruellia difformis* Linn. f. Suppl. 289, 1781. *Cardanthera difformis* (Linn. f.) Druce in Rep. Bot. Exch. cl. Brit. Isles suppl. 11: 612, 1917; Subramanyam, Bot. Monogr. 3: 39, 1962 (CSIR). *Adenosma triflora* Nees in Wall. Pl. As. Rar. 3: 79, 1832 & in DC. Prodr. 11: 68, 1847. *Ruellia triflora* Roxb. [Hort. Beng. 64, 1814 (nomen)] Fl. Ind. 3, 1832. *Cardanthera triflora* (Roxb.) Buchan. ex Voigt, Hort. Suburb. Calc.

482, 1845; Clarke l.c. *Synnema triflorum* (Roxb.) O. Ktze. l.c.

Hygrophila biplicata (Nees) Sreem. comb. nov. *Adenosma biplicata* Nees in Wall. Pl. As. Rar. 3: 79, 1832 & in DC. Prodr. 11: 68, 1847. *Cardanthera avana* (Wall. ex Benth.) Benth. ex Clarke l.c. *Pedicularis avana* Wall. ex Benth. Scroph. Ind. 52, 1835. *Synnema avanum* (Wall. ex Benth.) Benth. in DC. Prodr. 10: 538, 1845. *S. biplicata* (Nees) Imlay in Kew Bull. 111, 1939.

H. heinei Sreem. nom. nov. *Ruellia uliginosa* Linn. f. Suppl. 290, 1791. *Adenosma uliginosa* (Linn. f.) Nees in Wall. Pl. As. Rar. 3: 79, 1832. *Cardanthera uliginosa* (Linn. f.) Benth. ex Clarke l.c. 403. *Synnema uliginosum* (Linn. f.) O. Ktze. l.c.; Lindau l.c.

The epithet '*uliginosa*' is preoccupied in *Hygrophila by H. uliginosa* S. Moore, J. Bot. 18: 197, 1880—a well known African species.

Cardanthera thwaitesii Benth. and *C. anomala* Blatter are not included as I have not been able to examine materials of these species.

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A NEW SPECIES OF *GAULTHERIA* FROM NEFA

Gaultheria seshagiriana Sub. et Kum. sp. nov.

Accedit ad *G. dumicolam* W. W. Sm., ab ea tamen differt foliis minoribus, nervorum natura, bracteolis longioribus et ovario fere glabro.

Frutex, ramis glabris. Folia alterna, glabra, 3.3-12 × 1.5-4.8 cm, ovato-lanceolata, apice breviter acuminato duro et ad latus curvato, basi rotunda vel late cuneata, marginibus mucronulato-serratis, nervis lateralibus 4, quorum par exterius, e basi surgit nec prominens est, par interius eminens e basi vel ca. 1 cm supra basin surgit, nervo medio et bino nervo interiore canaliculato in facie superiore et eminenter elevato in inferiore, reticulatione in pagina superiore plus minusve eminenti, pagina inferiore levi et nitenti; petioli 3-5 mm longi, glabri. Inflorescentia perulata, axillaris, racemosa, laxa, ad 2.5 cm longa; pedicelli 10-12 mm longi; bracteae et bracteolae ad basin pedicellorum; bracteae lanceolatae, 5-6 mm longae, dimidio superiore pubescente in utroque pagina, marginibus ciliatis; bracteolae suboppositae, 2-3 mm longae, dimidio superiore pubescente in utroque pagina, marginibus ciliatis. Calyx cupularis, ± 4 mm diam., alte 5-fidus, lobi ovoidei, acuti, nervo medio obscuro, 2.5 × 1.5 mm, pubescentes in utroque pagina prope apicem, marginibus ciliatis. Corolla late campanulata, roseo-alba, glabra, ± 3.5 mm longa, ± 5 mm diam.; lobi triangulares, acuti, ± 1 mm longi, paulum recurvi. Stamina 10, ± 3 mm longa; filamenta subulata, paulum pubescentia, 1.5 mm longa; antherae oblongo-lanceolatae, ± 2 mm longae, dorsifixae, rotundae ad basin, fastigatae supra, lobis singulis duplici cornu apicali ornatis. Ovarium 5-lobum, supra depressum, ± 2 mm diam., fere glabrum; stylus ± 3 mm longus, glaber; stigma incrassatum, sub-capitatum. Fructus baccatus, ad maturitatem caeruleus.

Holotypus *R. S. Rao* 17863A et isotypus *R. S. Rao* 17863B lecti ad Takepokoeng. alt. 1737 m, in Div. Siang in NEFA die 19 novembris 1958 a R. S. Rao, et positi in CAL.

Gaultheria seshagiriana Subbarao et Kumari sp. nov.

This species differs from *Gaultheria dumicola* W. W. Sm. in smaller leaves, nature of venation, longer bracteoles and almost glabrous ovary.

Shrub, branches glabrous. Leaves alternate, glabrous, 3.3-12 × 1.5-4.8 cm, ovate-lanceolate, tip shortly acuminate, hard and bent to a side, base rounded or broadly cuneate, margin mucronulate-serrate; lateral veins 4, the outermost pair raises at the base and not prominent, the inner pair prominent and raising from the base or ± 1 cm above the base, midrib and inner pair of veins channelled on the upper surface and prominently raised on the lower surface; reticulation on upper surface ± prominent and under surface smooth and shining; petiole 3-5 mm long, glabrous. Inflorescence perulate, axillary, racemose, lax, upto 2.5 cm long; pedicels 10-12 mm long; bracts and bracteoles at the base of pedicels, bracts lanceolate, 5-6 mm long, upper half pubescent on both sides, margin ciliate; bracteoles subopposite, 2-3 mm long, upper half pubescent on both sides, margin ciliate. Calyx